

# Chapter 6 (3)

*Answers to Practice Problems*

1)

| Atom  | Total no. of electrons | No. of valence electrons | Electronic configuration   | Orbital diagram  |
|-------|------------------------|--------------------------|----------------------------|--|
| A) Na | 11                     | 1                        | $1s^2 2s^2 2p^6 3s^1$      | <br>$1s^2 \quad 2s^2 \quad 2p^6 \quad 3s^1$            |
| B) O  | 8                      | 6                        | $1s^2 2s^2 2p^4$           | <br>$1s^2 \quad 2s^2 \quad 2p^4$                       |
| C) Cl | 17                     | 7                        | $1s^2 2s^2 2p^6 3s^2 3p^5$ | <br>$1s^2 \quad 2s^2 \quad 2p^6 \quad 3s^2 \quad 3p^5$ |
| D) Ne | 10                     | 8                        | $1s^2 2s^2 2p^6$           | <br>$1s^2 \quad 2s^2 \quad 2p^6$                       |
| E) H  | 1                      | 1                        | $1s^1$                     | <br>$1s^1$   |

2)

| Atom                | Total no. of electrons | No. of valence electrons | Electronic configuration   | Orbital diagram  |
|---------------------|------------------------|--------------------------|----------------------------|--|
| A) $\text{K}^{+1}$  |                        |                          |                            |  |
| B) $\text{Cl}^{-1}$ | 18                     | 8                        | $1s^2 2s^2 2p^6 3s^2 3p^6$ | <br>$1s^2 \quad 2s^2 \quad 2p^6 \quad 3s^2 \quad 3p^6$ |
| C) $\text{Ca}^{+2}$ |                        |                          |                            |  |
| D) $\text{Mg}^{+2}$ |                        |                          |                            |  |
| E) $\text{O}^{-2}$  | 10                     | 8                        | $1s^2 2s^2 2p^6$           | <br>$1s^2 \quad 2s^2 \quad 2p^6$                       |

- A, B and C are isoelectronic
- D and E are isoelectronic

3)

| Atom  | Total no. of electrons | No. of valence electrons | Electronic configuration                | Abbreviated electronic configuration |
|-------|------------------------|--------------------------|---|--------------------------------------|
| A) Fe | 26                     | 2 (4s)                   | $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$    | [Ar]4s <sup>2</sup> 3d <sup>6</sup>  |
| B) Cu | 29                     | 1 (4s)                   | $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$ | [Ar]4s <sup>1</sup> 3d <sup>10</sup> |
| C) Cr | 24                     | 1 (4s)                   | $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$    | [Ar]4s <sup>1</sup> 3d <sup>5</sup>  |
| D) Ni | 28                     | 2 (4s)                   | $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$    | [Ar]4s <sup>2</sup> 3d <sup>8</sup>  |

**Cu and Cr have exceptional configurations in 4s and 3d.**